AMENDMENTS TO THE CLAIMS

1. (Previously Amended) A process for producing a silica-based film, the process comprising irradiating a film comprising at least one siloxane compound with electron beams at an irradiation dose of from 1 to 200 $\mu C/cm^2$ to thereby convert the film into a film having a dielectric constant of 3 or lower and having silicon carbide bonds represented by Si-C-Si.

2. (Original) The process as claimed in claim 1, wherein the silica-based film has a dielectric constant of 2.8 or lower.

3. (Previously Amended) The process as claimed in claim 1, wherein the siloxane compound is a product of the hydrolysis and/or condensation of at least one compound selected from the group consisting of compounds represented by the following formula (1):

$$R^1_aSi(OR^2)_{4-a} \qquad (1)$$

wherein R^1 represents a monovalent organic group or a hydrogen atom; R^2 represents a monovalent organic group; and a is an integer of 0 to 2,

and compounds represented by the following formula (2):

$$R^3_b(R^4O)_{3-b}Si\text{-}(R^7)_d\text{-}Si(OR^5)_{3-c}R^6_c \qquad (2)$$

wherein R^3, R^4, R^5, and R^6 may be the same or different and each represents a monovalent organic group; b and c may be the same or different and each is an integer of 0 to 2; R^7 represents an oxygen atom or a group represented by $-(CH_2)_n-$, wherein n is 1 to 6; and d is 0 or 1.

4. (Original) The process as claimed in claim 1, wherein the film comprising a siloxane compound is an organic silica film.

5. (Original) The process as claimed in claim 1, wherein the film comprising a

6. (Previously Amended) The process as claimed in claim 1, wherein the electron beam irradiation is conducted at an energy of from 0.1 to 50 keV.

7. (Original) The process as claimed in claim 1, wherein the electron beam irradiation is conducted at 25 to 500°C.

8. (Original) The process as claimed in claim 1, wherein the electron beam irradiation is conducted in an atmosphere having an oxygen concentration of 10,000 ppm or lower.

9. (Original) The process as claimed in claim 1, wherein the electron beam irradiation is conducted in an inert gas atmosphere.

10. (Original) The process as claimed in claim 1, wherein the electron beam irradiation is conducted at 133.3 Pa or lower.

11. (Original) The process as claimed in claim 1, wherein the film comprising a siloxane compound is heat-cured at 300 to 500°C before being subjected to the electron beam irradiation.

12. (Original) A silica-based film obtained by the process as claimed in claim 1.

13. (Original) The silica-based film as claimed in claim 12, which has a carbon content of from 5 to 17% by mole.

14. (Original) A low-dielectric film comprising the silica-based film as claimed in claim 12.

15. (Original) A semiconductor device having the low-dielectric film as claimed in claim 14.

16. (Canceled)

17. (New) The process as claimed in claim 1, wherein the electron beam irradiation is

SUPPORT FOR THE AMENDMENTS

This Amendment adds new Claim 17. Support for the amendments is found in the specification at least at page 27, lines 4-7. No new matter would be introduced by entry of these amendments.

Upon entry of these amendments, Claims 1-15 and 17 will be pending in this application. Claim 1 is independent.

REMARKS

Applicants respectfully request entry of the foregoing and reexamination and reconsideration of the application, as amended, in light of the remarks that follow.

Applicants thank the Examiner for the courtesies extended to their representative during the March 14, 2003, personal interview.

As discussed at the interview, conventional insulating films produced by converting a siloxane resin into silica (SiO_2) have a dielectric constant of from 3.5 to 4.2, which is too high for high frequency applications in semiconductor devices. In contrast, the present invention provides a process for producing a silica-based film having a dielectric constant of 3 or lower by irradiating a siloxane compound with an electron dose of from 1 to 200 $\mu C/cm^2$.

Claims 1-15 are rejected under 35 U.S.C. §102(e) or, in the alternative, under 35 U.S.C. §103(a) over U.S. Patent No. 6,204,201 ("Ross").

Ross discloses processes using electron beam exposure to remove moisture and other contaminants from the surface of dielectric films. (Ross at abstract, lines 1-3.) The dielectric films can be formed from dielectric compositions including siloxane compounds. (Ross at